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be in some degree independent of structure, has a tendency to vary by slow degrees. The extremity of the tail of this snake is terminated by a point, which is very slightly enlarged; and as the animal glides along, it constantly vibrates the last inch; and this part striking against the dry grass and brushwood, produces a rattling noise, which can be distinctly heard at the distance of six feet. As often as the animal was irritated or surprised, its tail was shaken; and the vibrations were extremely rapid. Even as long as the body retained its irritability, a tendency to this habitual movement was evident. This *Trigonocephalus* has, therefore, in some respects, the structure of a viper, with the habits of a rattlesnake; the noise, however, being produced by a simpler device."

It was these remarks of Darwin that first suggested the problem of the rattlesnake's tail to my mind, and, as I had thought considerably about the matter, of course I was deeply interested in the paper by Prof. Shaler; but I must acknowledge that, while many of his suggestions are correct and highly valuable, I was disappointed to find that the only advantageous use, in his estimation, of this tail appendage of the rattlesnake, is an imitative call-note to allure birds within its reach, and that, otherwise, it is rather a disadvantage than an advantage to be preserved and perfected by natural selection. If it is useful for both purposes, then there is a double reason for the action of natural selection. If it is not used as an imitative call-note, but is useful in the manner I have pointed out, then I have shown that it is explained by natural selection.

ORNITHOLOGICAL NOTES FROM THE WEST.

BY J. A. ALLEN.

I. NOTES ON THE BIRDS OF KANSAS.

IN the spring of 1871 an expedition to the Plains and the Rocky Mountains was sent out by the Museum of Comparative Zoölogy, under the charge of the writer. During the nine months spent in the field by the party in question, the department of ornithology received a large share of attention. In the following pages it is proposed to give a hasty résumé of such observations

as may be supposed to interest the ornithological readers of the NATURALIST, reserving a more detailed and formal report for publication elsewhere.*

Leavenworth, Kansas, was the point at which we commenced our labors. During the ten days spent at this locality we collected or observed nearly one hundred species of birds. Although we arrived here May 2d, the country wore the aspect of a New England June. The prairies were already green with waving grass and the forests were nearly in full leaf. The apple trees were some days out of bloom, and the young cherries were as large as very large peas; the vegetation being fully a month in advance of its usual stage in Southern New England at the same date. Comparatively few of the birds, however, were nesting; some had not arrived from the South, and others whose breeding stations were more to the northward still lingered.

We found in the vicinity of Leavenworth a collector's paradise, the forests of the Missouri bottom-lands literally swarming with birds, many of which none of the party had before seen in life, the general aspect of the ornithological fauna being strikingly diverse from that of the northeastern states. The red-headed and red-bellied woodpeckers (*Melanerpes erythrocephalus* and *Centurus Carolinus*) revelled among the grand old elms and cottonwoods of the bottom-lands, some of which tower to the height of one hundred to one hundred and fifty feet. The golden-shafted flicker (*Colaptes auratus*) was almost equally abundant, and showed its close affinity with its red-shafted brother of the mountains and the Pacific Slope (*C. Mexicanus*) by already frequently presenting touches of red in its black check patches. Although the hairy and downy woodpeckers (*Picus villosus* and *P. pubescens*) were both observed, they seemed by no means common. The crested titmouse (*Lophophanes bicolor*) and the merry cardinal (*Cardinalis Virginianus*) vied with each other in their noisy demonstrations, both being exceedingly abundant and garrulous. Their vocabulary seemed inexhaustible, as they every day astonished us with new sounds, which we often at first supposed to proceed from some bird hitherto unknown to us. The blue jay (*Cyanura cristata*) was equally

*This report will embrace annotated faunal lists for eight localities, with a general summary list for the whole. Mr. C. W. Bennett accompanied the expedition as taxidermist, and Mr. Richard Bliss as ichthyologist, both of whom, especially the former, greatly aided in the ornithological work.

at home, and as vivacious and even more gayly colored than at the north. While he seemed to have forgotten none of the droll notes and fantastic ways one always expects from him, he has here added to his manners the familiarity that usually characterizes him in the more newly settled parts of the country, and anon surprised us with some new expression of his feelings or sentiments,—some unexpected eccentricity in his varied notes, perhaps developed by his more southern surroundings. The yellow-breasted chat (*Icteria virens*) disported himself among the tangled underbrush, and seemed highly to enjoy the discomfiture to which he often put us, through his well-known ventriloquial accomplishments, in our search for his exact whereabouts. The Carolina wren (*Thryothorus Ludovicianus*) was more or less common, and already had young full-fledged on our arrival, while the only other birds then found breeding were the cardinal, the towhee and the brown thrush. Most of these, however, were still pairing and nestbuilding. The common chickadee (*Parus atricapillus*) and the house wren (*Troglodytes ædon*) were both common, but were far less numerous and much more retiring than their more demonstrative southern relatives already mentioned.

Among the warblers three southern forms were the most common, their bright colors often attracting the eye as they flitted through the openings among the trees. These were the Kentucky (*Oporornis formosus*), the hooded (*Wilsonia mitrata* Bon.) and the blue-winged yellow (*Helminthophaga pinus*). They seemed aware that they were especial objects of attention to the collector, and took good care not to exhibit themselves unnecessarily. The golden-crowned warbler (*Helminthophaga celata*) was also one of the most numerous of the *Sylvicolidæ*. The Nashville (*H. rubricapilla*), the blue yellow-backed (*Parula Americana*) and the black and white creeper (*Mniotilta varia*) were likewise moderately frequent. The beautiful cærulean warbler (*Dendroæca cærulea*) was met with a few times, the Blackburnian (*D. Blackburniæ*) once or twice, and the yellow rumped (*D. coronata*) but once, though the latter was doubtless common somewhat earlier in the season. The yellow warbler (*D. æstiva*) was more or less common along the outskirts of the forests; the chestnut-sided (*D. Pennsylvanica*) was by no means rare; redstarts (*Setophaga ruticilla*) were seen but a few times, and the Maryland yellow-throat (*Geothlypis trichas*) was far from numerous.

Of thrushes, by far the most common was the wood thrush (*Turdus mustelinus*), which was abundant. Although it was the pairing season, they were comparatively quite unmusical, their song being shorter, and, it seemed to me, far inferior to that of the representatives of this species at the North. The birds were also much less wary, being easily approached. I shot five or six in half an hour during one of our excursions, and might have easily got as many more had not rarer species more especially attracted my attention. The olive-backed thrush (*T. Swainsonii*) was also common, but save the brown thrush (*Harporhynchus rufus*) and the catbird, which were both tolerably numerous, no other thrush, not even the robin, was met with. The common eastern bluebird (*Sialia sialis*) was frequent, especially near the borders of the forests.

Of vireos, three species only were seen,—the red-eyed, the warbling and the white-eyed, all of which were moderately and about equally frequent. The logger-headed shrike (*Collurio Ludoviciana*) was occasionally seen, generally along the edges of the prairie.

Harris's finch (*Zonotrichia querula*) was, next to the cardinal, the most abundant species of the family of sparrows and finches, as it was also one of the largest and handsomest. It almost exclusively frequented the damper parts of the woods, associating with the white-throated sparrow (*Z. albicollis*), much resembling it both in habits and song. The white crowned (*Z. leucophrys*) and Lincoln's sparrow (*Melospiza Lincolnii*) were each a few times met with. The song sparrow was scarcely observed; the swamp sparrow was common, as were also the chipping and field sparrows. The beautiful lark finch (*Chondestes grammaca*) was among the rarer species. The towhee was numerous and the indigo bird (*Cyanospiza cyanea*) made its appearance in considerable numbers soon after our arrival. The black-winged red bird, or scarlet tanager, was the only representative we saw of the tanagers. It was, however, abundant, and though so gorgeously arrayed at the north, the intensity of its colors was appreciably greater here.

Of the *Icteridæ*, the Baltimore and orchard orioles were both abundant, the Baltimore indulging in a dialect so different from that of its northern relatives as often to puzzle us to make out to what bird its strange notes belonged. Its colors, also, were

unusually bright in all the specimens examined. The red-winged blackbirds and the purple grackle (*Quiscalus purpureus*) were both numerous, the latter presenting the brassy tints somewhat peculiar to the western race of this flexible species. The lazy, ubiquitous cowbird (*Molothrus pecoris*) was ever lurking in the trees and bushes, watching for an opportunity of shirking the burden of hatching and rearing its young upon some more industrious neighbor, wholly oblivious of respectability and fair play in respect to its domestic affairs. On the prairies the meadow lark (*Sturnella Ludoviciana*) filled the air with the wild, sweet melody so characteristic of this bird in the prairie states.

Among the swallows, the purple martin (*Progne subis*) was one of the most numerous, breeding in all parts of the city in boxes liberally provided for their accommodation. This bird seems to be a universal favorite in the more newly settled parts of the west, the erection of martin boxes being one of the settlers' first "improvements." Hence this bird is often common where none could exist without man's kindly aid. The barn, cliff, white-bellied, bank and rough-winged swallows were also more or less common. The swift (*Chaetura pelagica*) was quite numerous, breeding chiefly in the hollow trees of the forest, which it always seems to prefer to chimneys, to which it has to resort in most of the longer settled districts, or else abandon the country.

The Carolina dove was abundant almost everywhere; the quail (*Ortyx Virginianus*) was equally numerous, but affecting chiefly the neighborhood of thickets. The prairie chicken still forms the chief game bird of the prairies.

Of birds of prey few were observed beyond such almost universally common species as the marsh hawk and the sparrow hawk. The latter was nesting abundantly in woodpeckers' holes in the forests. Between this bird and the red-headed woodpecker we witnessed many fierce encounters, the woodpecker being usually the aggressor, but by no means always the victor.

The few water birds seen were chiefly of the following species: spotted and solitary sandpipers, both common; the lesser tell-tale or "yellow legs" (*Gambetta flavipes*) and the red-backed sandpiper (*Pelidna Americana*) were also quite numerous about the lagoons, which were also inhabited by an abundance of "mud hens" (*Fulica Americana*), and frequented by teals, mallards and wood ducks. Our stay being so short at this interesting locality, many birds

were doubtless to be found here of which we met with no examples.

Leaving Leavenworth, our next stop was at Topeka, where we also tarried for ten days, devoting the time almost exclusively to ornithologizing. Here also we observed about one hundred species, including a few not met with at Leavenworth, while some birds that were among those most numerously represented there, were not seen at Topeka. Among those especially missed was Harris's finch, and among the new forms Bell's vireo, Nuttall's whippoorwill and the yellow-headed blackbird were the most noteworthy. As Bell's vireo did not appear here till some days after our arrival, it may be expected to be equally numerous at Leavenworth, as the ornithological fauna of the two localities is essentially identical, the distance between them being less than a hundred miles, and both being in nearly the same latitude.

At no point have I ever met with birds in greater abundance than at Topeka, either in individuals or species. On the day of our arrival there I counted, during a half hour's stroll in the woods near the town, about thirty species, of most of which I observed several individuals, whilst several of them were extremely abundant. This may result from the trees being restricted to a narrow belt along the Kaw river, thus crowding all those more or less restricted to a timbered country into a comparatively limited area. The trees here are smaller than along the Missouri, less crowded, and with a thicker undergrowth. Considerable areas were covered with quite young trees, forming, with the dense undergrowth of hazel, dwarf oak and sumach bushes almost impenetrable thickets; and the forests were broadly fringed with a dense growth of these bushes, extending at times far out on the prairies. These brush patches were the favorite haunt of the yellow-breasted chat, the black-throated bunting and the several species of *Spizella*, among which we here first met with the *S. pallida*, or clay-colored sparrow. The chats were so abundant that three or four to half a dozen would be sometimes seen hovering and singing in the air at once, each striving to outdo the other, in grotesque manœuvring and in song, while a dozen or two black-throated buntings would be also in sight or hearing engaged in a similar vocal rivalry. Although the males of the latter species were so numerous, a female was rarely seen. Whenever one ventured into sight the males would most ungallantly start in

pursuit of her, and oblige her to seek concealment again,—a treatment similar to that indulged in by the bobolink toward his “better half.” The thinner portions of the wooded area were the favorite haunts of Bell’s vireo, which immediately upon its arrival became one of the most numerously represented species. They very soon commenced pairing, the males almost incessantly uttering their rather pleasing though peculiar and feeble song.

Among the other later arriving birds was the golden-crowned wagtail (*Seiurus aurocapillus*) and the swallow-tailed kite (*Nauclerus furcatus*). The former appeared on the 15th of the month (May), and immediately the woods were ringing with its familiar song. The arrival of this bird so late in the season was quite unexpected, the trees being not only in full leaf, but vegetation generally was quite far advanced, strawberries being already ripening in abundance in the fields, whilst for days the temperature had been that of July in southern New England. This interesting little woodland songster is pretty sure to make his appearance in Massachusetts with the earliest unfolding of the leaves, arriving there rather earlier than we this year observed it to appear in Kansas.

At this place we saw the only robins—a single pair—and the only cedar birds (one or two small flocks) met during our sojourn of over two months in the state of Kansas. The blue-gray gnatcatcher (*Poliophtila cœrulea*) was here also met with once, and the only time in the State.

Leaving Topeka May 24th, we arrived the following day at Fort Hays, situated some three hundred miles west of the Missouri river, and fairly out on the “Great Plains.” The only timber found here consists of a somewhat interrupted fringe of elms, box elder and cottonwoods along the streams, and this entirely disappears a few miles further to the westward. We hence have here all the characteristic birds of the Plains, in addition to many eastern species that follow the timber up the streams as far as timber regularly extends, even after the timber belts become extremely restricted and irregular. Remaining five weeks in the vicinity of Fort Hays enabled us to become thoroughly familiar with the ornithology of this peculiar region, our excursions extending in different directions from fifteen to thirty miles from the Post, which, through the hospitality of the officers in command, formed our headquarters and base of operations.

When we arrived here the plains were everywhere covered with a carpet of short fine grass, varied with large patches of brightly-colored flowers,—yellow, orange and various shades of red and purple,—forming a landscape beautiful beyond description. Gradually the earlier plants passed out of bloom, the hot dry winds of June parched and withered the grass, and when we left, the first week in July, only the belts of deep green formed by the foliage of the trees along the streams, presented anything agreeable to the eye, these being doubly refreshing from their contrast with the almost desert-like aridity surrounding them. The daily maximum temperature ranging during our stay from about 90° to 108° F. in the shade, the reader may readily perceive the semi-tropical character of the summer climate of the plains.

The total number of species observed here was sixty-one, about ten per cent of which were by no means common. Among the species inhabiting the timber, the kingbird, the Arkansas flycatcher (*Tyrannus verticalis*), the purple grackle, red-headed woodpecker and the Baltimore and orchard orioles were by far the most common, all of which in fact were numerously represented. The brown thrush, the mockingbird, the black-headed grosbeak (*Guiraca melanocephala*), the chickadee (*Parus atricapillus*), the golden-shafted flicker, the warbling and Bell's vireos, and the common wren (*Troglodytes ædon*) were all more or less frequent. The kingfisher was occasional, and the Carolina dove everywhere abundant, far out on the plains as well as in the vicinity of the timber. The rough-winged swallow was also common, and colonies of the cliff swallow were met with breeding on the cliffs in the vicinity of the streams. A few purple martins were seen near the Post; night-hawks were abundant, resting on the trees during portions of each day, and breeding out on the plains. They were mostly of the pale variety commonly known as *Chordeiles Henryi*, but different specimens varied greatly in color, some being nearly as dark as eastern ones. The cowbird was seen far out on the plains as well as in the timber, but was nowhere numerous.

The birds that may be regarded as characteristic of the plains were chiefly the following: the meadow lark (*Strumella Ludoviciana*) everywhere abundant, representing typically the pale form of the plains known as *S. neglecta*. Its notes, however, were quite different from those of the representatives of this species living

to the eastward in the prairie states, being less varied and ringing, and more guttural. The horned lark was equally characteristic, being by far the most numerous species here met with. During the excessive heat of midday it was seen crouching with half open wings in the shade of some tussock of herbage; whilst in winter, when it is equally abundant, it is not uncommon to meet with considerable numbers that have died of the extreme cold, as was the writer's experience the past winter. The yellow-winged sparrow is also one of the most abundant species. The pine wood finch (*Peucea aestivalis*) of the South Atlantic and Gulf States, or rather the representative of that species, was quite frequently met with near the streams, where its sweetly modulated song greets the ear with the first break of dawn, and is again heard at night till the last trace of twilight has disappeared. It is here very appreciably paler than the race of *P. aestivalis* found in the pine barrens more to the eastward, though not otherwise sensibly different. It here constitutes the variety of this species known in the books as *P. Cassinii*. The lark finch (*Chondestes grammaca*) was also common, but affected chiefly the vicinity of the streams and damp hollows. The yellow-headed blackbird, whose biography was so well written sometime since in the NATURALIST* by Dr. Coues, was also a few times met with. But by far the most interesting species were the chestnut-collared bunting (*Plectrophanes ornatus*) and the lark bunting (*Calamospiza bicolor*), because both are not only characteristic of the region, but they are among the few birds strictly confined to the arid plains. Both were quite abundant, but were only met with on the high ridges and dry plateaus, where they seemed to live somewhat in colonies. At a few localities they were always numerous, but elsewhere were often not met with in a whole day's drive. They were rather wary, and very tenacious of life, often flying long distances when shot through vital parts. Most of the many specimens procured by us had to be killed on the wing at long range. Both are strong fliers and seem to delight in flying in the strongest gales, when all the other birds appear to move with difficulty and generally lay concealed among the grass. Both sing while on the wing, the lark bunting hovering in the wind, and shaking its tail and legs after the well known manner of the yellow-breasted chat. Indeed its song strongly

* Am. Nat., Vol. v, p. 195.

resembled the song of the chat, with which at such times its whole demeanor strikingly accords.

Among rasorial birds, the quail and the prairie chicken, both very recent emigrants, it is said, from the East, were occasional, and here reach their present western limit. The wild turkey is still abundant along all the more heavily wooded streams. The sharp-tailed grouse is also common, especially to the northward of Fort Hays.

Hawks were by no means numerous, excepting perhaps, the marsh hawk, which was moderately frequent. A single pair of duck hawks (*Falco peregrinus*) was found breeding on a cliff near the Saline, and one nest of the red-tail was found. Sparrow hawks were also occasionally seen near the timber, and a single pair of ravens was observed. The black vulture (*Cathartes aura*) was also frequent but far less numerous than would naturally be expected, from the abundance of food afforded them by the thousands of carcasses of decaying buffaloes that are scattered over the plains. The little burrowing owl (*Athene hypoleuca*) was seen at intervals, living in colonies in the prairie dog towns.

Water birds were few, the only ducks seen being a few representatives of the wood duck and the green-winged teal. The spotted sandpiper was more or less frequent along the streams, but the killdeer plover was by far the most numerous representative of the *Grallæ*. The so-called "mountain" plover was also occasional, and generally seen on the dry prairies far away from the streams and sloughs. A single stray representative of the Esquimaux curlew (*Numenius borealis*) and a single small colony of the long-billed curlew (*N. longirostris*) were also observed, the latter breeding. The only herons seen were one or two examples each of the little green heron and the night heron.

A few weeks passed near Fort Hays, in mid-winter, enables me to add a few notes respecting the winter birds of the Plains. One species only of the summer birds was met with in numbers in winter. This was the horned lark which was exceedingly numerous. The snow bunting was also abundant, and the Maccown's longspur (*Plectrophanes Maccownii*) tolerably frequent. The tree sparrow was occasional along the streams wherever there were bushes; the rough-legged buzzard was the most common hawk. None of the remaining twenty-four species of the total number of thirty observed, were numerous represented, and

were such as from their general known distribution would be expected here. Neither the bluebird nor the meadow lark was observed, but the kingfisher and golden-shafted flicker were both occasional.

In conclusion, some peculiarities in the nesting habits of some of the birds observed in Kansas are worthy of notice. A nest of the purple grackle was found in an old woodpecker's hole. Although this is the only instance of the kind I have as yet observed, my friend Mr. Wm. Brewster, of Cambridge, informs me that he has repeatedly found the same species breeding in woodpeckers' holes in Maine! The Carolina dove generally bred at Fort Hays in trees, as at the eastward; sometimes, however, laying in an old grackle's nest instead of being at the trouble of building one. One nest, however, was found *on the ground*, although bushes were growing but a few yards distant. More to the westward I learned that this bird—more common here than at the east—*always breeds on the ground*, as it is of course compelled to do, owing to the absence of either trees or bushes. Meeting with this bird in pairs in the breeding season far out on the Plains, sometimes ten miles from the nearest trees, led me to believe that this would be its habit, even before I had seen positive evidence that such was the case.

Other interesting instances of the modification of nesting habits may well be mentioned in this connection. The brown thrush is well known to vary the location of its nest according to the nature of the soil, nesting on the ground in sandy districts, and in bushes where the soil is damp or clayey. Among the clayey bluffs at Leavenworth we found it nesting in bushes; at Topeka on the ground; at Fort Hays in bushes, when breeding on high ground, and in trees, ten to fifteen or twenty feet from the ground, when nesting in the timber along Big Creek (a considerable stream on which Fort Hays is situated). We had an ample explanation of this latter departure from its usual habits during our stay at Fort Hays. Big Creek, flowing in a deep narrow bed, is subject, in summer, to sudden freshets, resulting from occasional heavy rain-falls, it rising sometimes ten or a dozen feet in a single night, as we once witnessed. The trees growing chiefly along the bed of the stream, the water at such times submerges not only the scanty underbrush, but all the lower branches of the trees. Hence the brown thrush, as well as all the other birds, appears here always to

select high nesting sights. Can such foresight be regarded as the result of "blind instinct?" As the highwater line is always indicated by the drifted matter lodged in the trees, is not this precaution the result rather of a rational appreciation of the exceptional dangers here to be guarded against, and this caution in the selection of a safe nesting site really the result of induction?

The cliff swallow (*Hirundo lunifrons*) we found breeding throughout the West in its primitive way, that is, on the faces of cliffs; yet where such natural facilities abounded they in some instances abandoned the rocks for the more sheltered nesting sites afforded them by buildings, plastering their mud dwellings against the building under the projecting eaves. At Topeka, however, we saw cliff swallows frequenting the *holes in the banks* of the Kaw River made by the sand martin, keeping in the company of these birds, entering their holes and presenting the same appearance of breeding in them as the sand martins themselves! Throughout the mountains of Colorado we found the violet-green swallow (*Hirundo thalassina*) breeding in abandoned woodpeckers' holes; but in the "Garden of the Gods", near Colorado City, they were nesting in holes in the rocks. We had good evidence also that the sparrow hawk bred there in the same manner,—in holes in the cliffs instead of in hollow trees! At Ogden, Utah, we found the red-shafted flicker frequenting holes in a high bank, and that these holes entered horizontally for a few inches only and then turned abruptly downward, having the same form they would have if made by this bird in a decayed tree. These circumstances left no doubt in our minds that these birds nested in the holes in the bank we saw them entering, although it was then past the breeding season. The region being but scantily wooded for many miles, there is certainly some reason for such a modification of their habits. While on this subject I may add that every collector must have noticed how much birds vary the material used in the construction of their nests with locality, using generally whatever is most easily obtained that is serviceable. Nests of the same species from different localities hence often differ greatly in appearance, enabling one sometimes to determine approximately the locality whence the nest came by the materials used in its construction.

Finally, I wish briefly to notice some peculiarities in the color of the plumage of the birds inhabiting the Plains. From

the extreme dryness of the atmosphere, the want of shelter from the intense rays of the sun — an intensity one can hardly appreciate until he has passed a few summer days far out on the Plains — and the dry, heated powerful winds so constant here, few would be surprised at the faded, bleached and worn plumage that characterizes the birds of the Plains. It is more noticeable of course in those that do not frequent the timber, though more or less apparent in all. Here the common “house” wren is bleached and faded, forming the so-called *Troglodytes Parkmanni*, differing from the *T. ædon* of the east only in this particular. The meadow and horned larks look singularly “weather worn,” the former constituting the *Sturnella neglecta* of authors, and the latter the *Alauda rufa* of Audubon, in which the yellow almost entirely disappears from the forehead, throat and lores, fading to white. The night-hawk becomes much lighter and paler, forming the race known as *Chordeiles Henryi*; *Peucea æstivalis* wears a very faded aspect, and forms the so called *P. Cassinii*. The yellow-winged sparrow becomes equally faded and changed, and the killdeer plover shows a similar paling of the colors, which is also noticeable in birds as brightly colored as the Baltimore oriole. The color of the mountain plover is in similar harmony with the mid-summer gray tint of the plains. In respect to the Baltimore, we find here a well marked race, characterized by the middle coverts of the wing being *white* instead of bright yellow, and by having much more white on edges of the secondaries. The bill is also slenderer and relatively longer. The Leavenworth specimens I find are, in respect to color, about half way between the Fort Hays type and the common form of the Eastern States.

DIRECTIONS FOR COLLECTING MICROLEPIDOPTERA.

BY LORD WALSLINGHAM.

HAVING been asked to give a few directions for collecting Microlepidoptera, I think I can best do so by describing as shortly as possible my own mode of proceeding, adding such hints as may occur to me.